Clear Lake, Steuben County

Supplemental Walleye Evaluation

Dates of Survey: September 22 and 29, 2010

Biologist: Neil D. Ledet, District 2 Fisheries Biologist

Objective: The objectives of this survey were to evaluate survival of fall stocked advanced fingerling walleyes in 2009 and June fingerlings stocked in 2010 in accordance with work plan 300FW1F10D42617.

Methods: Fish collection effort consisted of a total of 4.0 hours of pulsed D.C. nighttime electrofishing. Only walleyes were collected using two dip netters. Fish were measured to the nearest 0.1 in TL and weights were taken to the nearest 0.01 pounds.

Introduction: Walleye stocking in Clear Lake by the Division of Fish and Wildlife (DFW) began in 1974. Initially the lake was one of the most successfully stocked lakes in northeast Indiana (Table 1). Between 1974 and 1979, walleye fry were stocked on four occasions with some success. From 1979 through 1987, June fingerlings (1.5 in TL) were stocked at a rate of 200 per acre. For the last 20 years, approximately 80,000 (100 per acre) 1.5 in TL June fingerling walleyes have been stocked annually. Based on the criteria for success as outlined in Walleye Management in Indiana, (Andrews 1994) the Clear Lake walleye program has generally been successful. However, survival from these stockings has been sporadic and unpredictable, especially since the mid 1990's (Ledet 2009). Following marginal survival of the 2009 June fingerling stocking, Clear Lake was stocked with approximately 3,100 (3.9 per acre) advance fall walleye. These fish ranged from 4.7 – 6.7 in TL and were part of a DFW experimental rearing project.

During the 2010 survey, 37 walleyes were collected. Nineteen of these were age-0 fish from the 2010 June stocking. These fish were collected at a rate of 4.8 per electrofishing hour, shy of the 7 per hour criteria for success. They ranged in length from 6.0 to 8.9 in TL and averaged 7.7 in TL, identical to the historical average. Fifteen age-1 (3.4 per electrofishing hour) and three age-3

or older walleyes were also collected. The age-1 fish range in length from 9.5 in TL to 12.7 in TL and averaged 11.3 in TL. Considering the marginal survival of the 2009 June fingerling stocking, it's likely that the majority of the age-1 fish collected were from the 2009 stocking of advance walleye. Water temperatures on the nights of this survey were 68°F and 69°F.

Summary: Fall nighttime DC electrofishing surveys continue to be the main tool used to evaluate initial survival of stocked walleye, especially for young of the year (age-0) and age-1 fish. Since 1982, fall sampling has been conducted at Clear Lake in 20 seasons. The number of age-0 walleyes collected per electrofishing hour ranged from 0 to 16.3 per hour and average 7.7 per hour. The number of age-1 walleyes collected per electrofishing hour ranged from 0 to 6.7 per hour and averaged 1.9 per hour.

Compared to Bass Lake, which is stocked with 4 day old walleye fry and Lake Maxinkuckee which is stocked with June fingerlings, the Clear Lake catch rate of age-0 and age-1 walleyes was relatively low (Table 2). In recent years, several lakes have been stocked with advanced, 6-8 in TL fall fingerling walleyes. The catch rate of age-1 walleyes at these lakes has ranged from 3.4 per electrofishing hour at Big Turkey Lake, which was stocked with 4.5 fall fingerlings per acre, to 21.0 per electrofishing hour at Pretty Lake, with an average stocking of 11.2 per acre. The catch rate of age-1 walleyes at Clear Lake was 1.1 and 3.0 per electrofishing hour from annual stockings of 100 and 200 June fingerlings per acre respectively (Table 3).

Since 1977, 486 age-0, 237 age-1 and 49 age-2 walleyes have been collected from Clear Lake during fall gill netting and nighttime DC electrofishing surveys combined. The average length for a fall age-0, age-1 and age-2 walleyes was 7.7 in TL, 11.7 in TL and 15.3 in TL respectively (Table 4). These average lengths are within the range observed at five other northern Indiana natural lakes (Table 5).

Recent information from the Wisconsin and Ontario natural resources agencies suggests that raising water temperatures, increased water clarity as a result of reduced nutrient input and filtration by zebra mussels along with increased bass populations may be responsible for some of their declining walleye populations. These declines include both natural reproducing populations

and those maintained by stocking. Considering that zebra mussels have also invaded Indiana, including several of the lakes managed for walleye and that the number of bass in our natural lakes have nearly doubled in the last 20 years, it's possible that these factors are contributing to the sporadic and unpredictable walleye survival that we have experience with stocking June fingerlings.

Recommendations: As recommended in 2009, walleye stockings at Clear Lake should shift from June fingerling to advanced fall fingerlings. These fish should be stocked at 10 per acre with a minimum size of 7 inches. As this shift occurs, fall electrofishing surveys will be conducted to monitor recruitment, growth and initial survival.

Literature cited:

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Date 2/7/11

Table 1. Clear Lake walleye stocking and number of age-0 through age-3 or older walleyes collected per fall nighttime DC electrofishing hour, 1974 – 2008.

| Month/Year | Number Stocked | Size Stocked | Effort hrs. | Number Age-0 /hr | Number Age-1 /hr | Number Age-2 /hr | Number ≥ Age-3 /hr |
|---|---|---|---|---|---|---|---|
| May 1974 | 82,000 | Fry | | | | | |
| May 1975 | 4,000,000 | Fry | | | | | |
| 1976 | None | | | | | | |
| May 1977 | 2,400,000 | Fry | | | | | |
| 1978 | None | | | | | | |
| May 1979 | 396,000 | Fry | | | | | |
| June 1979 | 167,553 | 1.8 | | | | | |
| 1980 | None | | | | | | |
| June 1981 | 131,999 | 1.6 | | | | | |
| May 1982 | 2,200,000 | Fry | 2.00 | 0 | 6.5 | 0 | 4.0 |
| June 1983 | 18,873 | 1.5 | 1.75 | 1.3 | 0 | 8.3 | 6.9 |
| July 1983 | 28,562 | 1.7 | | | | | |
| Sept.1983 | 3,420 | 5.6 | | | | | |
| Oct. 1983 | 15,850 | 3.8 | | | | | |
| Oct. 1983 | 215 | 8.4 | | | | | |
| June 1984 | 162,415 | 1.4 | 2.00 | 2.0 | 3.5 | 0 | 0 |
| Sept. 1984 | 613 | 3.9 | | | | | |
| June 1985 | 165,238 | 1.4 | 4.00 | 10.3 | 0.5 | 0 | 1.0 |
| June 1986 | 165,156 | 1.8 | 6.00 | 7.7 | 6.7 | 0 | 0.7 |
| Oct. 1986 | 1,035 | 7.5 | | | | | |
| June 1987 | 161,365 | 1.6 | 4.00 | 15.3 | 3.3 | 0.5 | 1.5 |
| June 1988 | 80,495 | 1.8 | 4.00 | 9.3 | 0.5 | 0.8 | 0.3 |
| June 1989 | 82,155 | 1.4 | 4.00 | 9.8 | 0.5 | 0.3 | 0.5 |
| June 1990 | 84,922 | 1.4 | 4.00 | 3.8 | 0.3 | 0 | 0.3 |
| June 1991 | 87,764 | 1.6 | 4.00 | 16.3 | 0 | 0.8 | 1.5 |
| June 1992 | 82,629 | 1.8 | | | | | |
| June 1993 | 83,910 | 1.7 | | | | | |
| June 1994 | 84,465 | 1.6 | | | | | |
| June 1995 | 83,200 | 1.5 | 4.00 | 8.8 | 1.8 | 0.8 | 0.3 |
| June 1996 | 80,030 | 1.2 | 4.00 | 3.8 | 2.0 | 0.8 | 0.3 |
| June 1997 | 121,395 | 0.9 | 2.25 | 0 | 0 | 0 | 0 |
| June 1998 | 90,000 | 1.5 | 4.00 | 14.5 | 0 | 0 | 0.8 |
| June 1999 | 91,830 | 1.5 | 6.00 | 4.0 | 5.3 | 0.2 | 0.5 |
| June 2000 | 89,850 | 1.4 | 4.00 | 9.5 | 0.5 | 1.5 | 0.8 |
| June 2001 | 81,285 | 1.6 | 4.00 | 3.3 | 1.5 | 1.0 | 0.5 |
| June 2002 | 82,030 | 1.2 | | | | | |
| June 2003 | 81,500 | 1.2 | | | | | |
| June 2004 | 82,062 | 1.7 | | | | | |
| June 2005 | 49,788 | 1.3 | | | | | |
| June 2006 | 67,850 | 1.5 | | | | | |

Table 1 continued

| Month/Year | Number Stocked | Size Stocked | Effort hrs. | Number Age-0 /hr | Number Age-1 /h | Number Age-2 /hr | Number ≥ Age-3 /hr |
|---|---|---|---|---|---|---|---|
| June 2007 | 35,050 | 1.4 | | | | | |
| June 2008 | None | | 2.0 | 0 | 0 | 0 | 0 |
| June 2009 | 94,260 | 1.6 | 5.5 | 2.9 | 0.4 | 1.3 | 1.0 |
| Oct 2009 | 1,240*<br>1,849** | 4.7<br>6.7 | | | | | |
| June 2010 | 80,140 | 1.5 | 2.0 | 4.8 | 3.8 | 0 | 0.8 |
| Average | | | | 6.4 | 1.9 | 0.9 | 1.0 |

* Forage reared @ Fawn River
** Pellet reared @ East Fork

Average does not include the fry stocking in 1982, the partial fingerling stocking in 2007 or the advanced walleyes stocked in 2009.

Table 2. Average historical fall nighttime DC electrofishing catch rates of age-0 through age-2 walleyes collected from Bass Lake, Clear Lake, Pretty Lake and Lake Maxinkuckee.

| Lake | Ave. Number of age-0 collected per hour | Ave. Number of age-1 collected per hour | Ave. Number of age-2 collected per hour |
|---|---|---|---|
| Bass Lake | 29.6 | 5.6 | 4.1 |
| Clear Lake | 6.4 | 1.9 | 0.9 |
| Lake Maxinkuckee | 13.6 | 3.7 | 1.5 |
| Pretty Lake | 4.9 | 2.5 | 1.4 |

Note: Bass Lake is stocked with fry while the other lakes are stocked with June fingerlings.

Table 3. Average fall nighttime DC electrofishing catch rates for age-1 walleyes collected from Big Turkey, Clear, Crooked, Pretty, Simonton, Sylvan, Wall and Winona lakes. Number of years sampled in ( ).

| Lake | Average Number of advanced fingerlings stocked per acre | Average Number of age-1 fish collected per electrofishing hour |
|---|---|---|
| Big Turkey (6) | 4.5 | 3.4 |
| Crooked (7) | 10.0 | 11.5 |
| Pretty (2) | 11.2 | 21.0 |
| Simonton (7) | 6.2 | 5.6 |
| Sylvan (7) | 19.0 | 20.7 |
| Wall (4) | 10.0 | 19.8 |
| Winona (7) | 19.2 | 12.4 |
| *Clear (12 / 4) | 100 / 200 | 1.1 / 3.0 |

* June fingerlings

Table 4. Number, length range and average length in inches of age-0 through age-2 walleyes collected during fall gill netting and or nighttime DC electrofishing surveys from Clear Lake, 1977 through 2010.

| | Age-0 | | | Age-1 | | | Age-2 | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Number Collected | Length Range | Average Length | Number Collected | Length Range | Average Length | Number Collected | Length Range | Average Length |
| 1977 | 0 | | | 16 | 9.0 – 11.5 | 10.6 | 2 | 15.5 | 15.5 |
| 1979 | 6 | 7.0 – 7.5 | 7.3 | 3 | 12.0 – 13.5 | 13.0 | | | |
| 1980 | 1 | 9.0 | 9.0 | 21 | 11.5 – 13.5 | 12.6 | 0 | | |
| 1982 | 0 | | | 24 | 9.5 – 12.5 | 11.6 | 0 | | |
| 1984 | 4 | 7.0 – 9.2 | 8.5 | 23 | 9.0 – 13.7 | 11.3 | 0 | | |
| 1985 | 47 | 6.1 – 8.4 | 7.0 | 20 | 10.0 – 15.0 | 13.5 | 17 | 13.8 – 15.8 | 15.1 |
| 1986 | 46 | 6.5 – 9.0 | 7.8 | 48 | 9.0 – 12.5 | 11.0 | 0 | | |
| 1987 | 6 | 7.0 – 9.0 | 7.8 | 13 | 10.5 – 13.0 | 11.8 | 2 | 14.0 – 15.0 | 14.5 |
| 1988 | 37 | 7.0 – 9.0 | 8.2 | 2 | 11.5 | 11.5 | 3 | 13.5 – 16.0 | 14.8 |
| 1989 | 39 | 6.7 – 8.7 | 8.1 | 2 | 12.0 – 12.5 | 12.3 | 1 | 17.0 | 17.0 |
| 1990 | 15 | 8.3 – 9.6 | 8.1 | 1 | 12.8 | 12.8 | 0 | | |
| 1991 | 65 | 6.8 – 9.2 | 8.2 | 0 | | | 3 | 14.5 – 16.5 | 15.3 |
| 1995 | 35 | 5.8 – 7.8 | 6.9 | 3 | 11.6 – 14.1 | 12.6 | 1 | 15.3 | 15.3 |
| 1996 | 15 | 6.3 – 9.0 | 7.8 | 8 | 10.1 – 13.5 | 11.9 | 3 | 13.5 – 15.9 | 14.7 |
| 1998 | 58 | 6.4 – 8.7 | 7.5 | 0 | | | 0 | | |
| 1999 | 24 | 6.3 – 9.2 | 7.0 | 28 | 9.3 – 13.6 | 11.4 | 1 | 16.2 | 16.2 |
| 2000 | 38 | 6.7 – 8.5 | 7.8 | 2 | 13.0 – 14.1 | 13.6 | 5 | 14.8 – 16.5 | 16.0 |
| 2001 | 14 | 6.4 – 7.3 | 6.7 | 6 | 11.3 – 13.6 | 12.3 | 4 | 15.2 – 16.6 | 16.0 |
| 2008 | 0 | | | 0 | | | 0 | | |
| 2009 | 16 | 6.6 – 9.4 | 7.4 | 2 | 11.5 – 13.0 | 12.3 | 7 | 13.5 – 16.4 | 15.5 |
| 2010 | 19 | 6.0 – 8.9 | 7.7 | 15 | 9.5 – 12.7 | 11.3 | 0 | | |
| Total | 485 | | 7.7 | 237 | | 11.7 | 49 | | 15.3 |

Table 5. Number and average length in inches of age-0 through age-2 walleyes collected during fall gill netting and or nighttime DC electrofishing surveys from six northern Indiana, 1997-2010.

| | Age-0 | | Age-1 | | Age-2 | |
|---|---|---|---|---|---|---|
| Lake | Number Collected | Average Length | Number Collected | Average Length | Number Collected | Average Length |
| Bass | | 6.5 | | 11.3 | | |
| B. Turkey | 0 | | 80 | 12.8 | 27 | 15.9 |
| Clear | 485 | 7.7 | 237 | 11.7 | 49 | 15.3 |
| Max | 660 | 7.7 | 190 | 11.9 | 73 | 14.7 |
| Pretty | 141 | 8.7 | 130 | 12.4 | 61 | *15.2 |
| Wall | 0 | | 119 | 12.0 | 33 | 14.5 |

*Average was 16.1 in TL prior to the 2009 sample of 28 age-2 walleyes.